

Application No. 10/605,858  
Docket No. 132855  
Reply dated November 30, 2007  
In Response to Office Action of October 31, 2007

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**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application.

**Listing of Claims:**

Claims 1 through 5 (Canceled)

Claim 6 (Currently amended): A process ~~according to claim 1,~~  
~~wherein the solvent is water.~~ of forming a diffusion coating on a component,  
the process comprising the steps of:

mixing a particulate donor material containing a coating element, an  
activator dissolved in water, and a particulate filler to form an adhesive mixture  
having a formable, malleable consistency, wherein the adhesive mixture does  
not contain an extraneous binder and the donor material and the filler within  
the adhesive mixture are cohered solely by the dissolved activator;

applying the adhesive mixture to at least one surface of the  
component;

drying the adhesive mixture after the applying step to remove the

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water from the adhesive mixture and thereby form a solid pack adhering to the  
at least one surface of the component; and  
heating the component to a temperature sufficient to vaporize and  
react the activator with the coating element of the donor material to form a  
reactive vapor of the coating element, the reactive vapor reacting at the at  
least one surface of the component to form a diffusion coating containing the  
coating element.

Claims 7 through 12 (Canceled)

Claim 13 (Previously presented): A process for forming a diffusion aluminide coating on a superalloy component of a gas turbine engine, the process comprising the steps of:

dissolving at least one ammonium halide activator in water to form an ammonium halide-containing solution;

mixing a particulate donor material containing aluminum and a particulate filler to form a powder mixture;

mixing the powder mixture and the ammonium halide-containing solution to form an adhesive mixture having a formable, malleable

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consistency, the donor material and the filler within the adhesive mixture being cohered solely by the at least one dissolved activator;

applying the adhesive mixture to at least one surface of the component;

drying the adhesive mixture to evaporate the water from the adhesive mixture and thereby form a solid pack that adheres to the at least one surface of the component, the at least one ammonium halide activator binding the donor material and the filler together within the solid pack; and then

heating the component in an inert or reducing atmosphere to a temperature that is held for a duration sufficient to vaporize and react the at least one ammonium halide activator with the aluminum of the donor material to form an aluminum halide vapor, the aluminum halide vapor reacting at the at least one surface of the component to form a diffusion aluminide coating.

Claim 14 (Original): A process according to claim 13, wherein the donor material comprises an aluminum alloy chosen from the group consisting of CrAl, CoAl, FeAl, and TiAl alloys.

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Claim 15 (Original): A process according to claim 13, wherein the at least one ammonium halide activator is chosen from the group consisting of  $\text{NH}_4\text{Cl}$ ,  $\text{NH}_4\text{Br}$ ,  $\text{NH}_4\text{I}$ ,  $\text{NH}_4\text{F}$ , and  $\text{NH}_4\text{HF}_2$ .

Claim 16 (Original): A process according to claim 13, wherein the adhesive mixture is prepared to further contain a metal halide activator.

Claim 17 (Original): A process according to claim 13, wherein the adhesive mixture is prepared to further contain clay.

Claim 18 (Original): A process according to claim 13, wherein the heating step is performed at a temperature of about  $800^\circ\text{C}$  to about  $1150^\circ\text{C}$ .

Claim 19 (Previously presented): A process according to claim 13, wherein the at least one surface of the component constitutes a limited surface portion of the component.

Claim 20 (Original): A process according to claim 13, wherein the adhesive mixture does not have a uniform thickness following the applying

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step.

Claims 21 through 25 (Canceled)

Claim 26 (Currently amended): A process ~~according to claim 21,~~  
~~wherein the solvent is water.~~ of forming a diffusion coating on a component,  
the process comprising the steps of:

dissolving an activator in water to form an activator solution;

mixing a particulate filler and a particulate donor material containing  
a coating element with the activator solution to form an adhesive mixture  
having a formable, malleable consistency, wherein the adhesive mixture does  
not contain an extraneous binder, and the donor material and the filler within  
the adhesive mixture are cohered solely by the dissolved activator;

applying the adhesive mixture to at least one surface of the  
component;

drying the adhesive mixture after the applying step to remove the  
water from the adhesive mixture and thereby form a solid pack adhering to the  
at least one surface of the component; and

heating the component to a temperature sufficient to vaporize and

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react the activator with the coating element of the donor material to form a reactive vapor of the coating element, the reactive vapor reacting at the at least one surface of the component to form a diffusion coating containing the coating element.

Claims 27 through 31 (Canceled)

Claim 32 (Previously presented): A process according to claim 13, wherein the adhesive mixture is selectively applied and adhered to the at least one surface of the component, and the heating step causes the diffusion aluminide coating to form on essentially only the at least one surface to which the adhesive mixture was selectively applied.

Claim 33 (Canceled)